

limited to surface conditions and other readily available data.

(d) The written report of the survey shall be signed by the person who conducted the survey. Copies of the report shall be promptly provided to the regulatory authority and to the person requesting the survey. If the person requesting the survey disagrees with the contents and/or recommendations contained therein, he or she may submit to both the operator and the regulatory authority a detailed description of the specific areas of disagreement.

(e) Any surveys requested more than 10 days before the planned initiation of blasting shall be completed by the operator before the initiation of blasting.

[48 FR 9809, Mar. 8, 1983]

§ 817.64 Use of explosives: General performance standards.

(a) The operator shall notify, in writing, residents within ½ mile of the blasting site and local governments of the proposed times and locations of blasting operations. Such notice of times that blasting is to be conducted may be announced weekly, but in no case less than 24 hours before blasting will occur.

(b) Unscheduled blasts may be conducted only where public or operator health and safety so requires and for emergency blasting actions. When an operator conducts an unscheduled surface blast incidental to underground coal mining operations, the operator, using audible signals, shall notify residents within ½ mile of the blasting site and document the reason in accordance with § 817.68(p).

(c) All blasting shall be conducted between sunrise and sunset unless nighttime blasting is approved by the regulatory authority based upon a showing by the operator that the public will be protected from adverse noise and other impacts. The regulatory authority may specify more restrictive time periods for blasting.

[48 FR 9809, Mar. 8, 1983]

§ 817.66 Use of explosives: Blasting signs, warnings, and access control.

(a) *Blasting signs.* Blasting signs shall meet the specifications of § 817.11. The operator shall—

(1) Conspicuously place signs reading “Blasting Area” along the edge of any blasting area that comes within 100 feet of any public-road right-of-way, and at the point where any other road provides access to the blasting area; and

(2) At all entrances to the permit area from public roads or highways, place conspicuous signs which state “Warning! Explosives in Use,” which clearly list and describe the meaning of the audible blast warning and all-clear signals that are in use, and which explain the marking of blasting areas and charged holes awaiting firing within the permit area.

(b) *Warnings.* Warning and all-clear signals of different character or pattern that are audible within a range of ½ mile from the point of the blast shall be given. Each person within the permit area and each person who resides or regularly works within ½ mile of the permit area shall be notified of the meaning of the signals in the blasting notification required in § 817.64(a).

(c) *Access control.* Access within the blasting areas shall be controlled to prevent presence of livestock or unauthorized persons during blasting and until an authorized representative of the operator has reasonably determined that—

(1) No unusual hazards, such as imminent slides or undetonated charges, exist; and

(2) Access to and travel within the blasting area can be safely resumed.

[48 FR 9810, Mar. 8, 1983]

§ 817.67 Use of explosives: Control of adverse effects.

(a) *General requirements.* Blasting shall be conducted to prevent injury to persons, damage to public or private property outside the permit area, adverse impacts on any underground mine, and change in the course, channel, or availability of surface or ground water outside the permit area.

(b) *Airblast—*(1) *Limits.* (i) Airblast shall not exceed the maximum limits listed below at the location of any dwelling, public building, school, church, or community or institutional building outside the permit area, except as provided in paragraph (e) of this section.

Lower frequency limit of measuring system, in Hz (± 3 dB)	Maximum level, in dB
0.1 Hz or lower—flat response ¹	134 peak.
2 Hz or lower—flat response	133 peak.
6 Hz or lower—flat response	129 peak.
C-weighted—slow response ¹	105 peak dBC.

¹ Only when approved by the regulatory authority.

(ii) If necessary to prevent damage, the regulatory authority may specify lower maximum allowable airblast levels than those of paragraph (b)(1)(i) of this section for use in the vicinity of a specific blasting operation.

(2) *Monitoring.* (i) The operator shall conduct periodic monitoring to ensure compliance with the airblast standards. The regulatory authority may require airblast measurement of any or all blasts and may specify the locations at which such measurements are taken.

(ii) The measuring systems used shall have an upper-end flat-frequency response of at least 200 Hz.

(c) *Flyrock.* Flyrock travelling in the air or along the ground shall not be cast from the blasting site—

(1) More than one-half the distance to the nearest dwelling or other occupied structure;

(2) Beyond the area of control required under § 817.66(c); or

(3) Beyond the permit boundary.

(d) *Ground vibration.*—(1) *General.* In all blasting operations, except as otherwise authorized in paragraph (e) of this section, the maximum ground vibration shall not exceed the values approved by the regulatory authority. The maximum ground vibration for protected structures listed in paragraph (d)(2)(i) of this section shall be established in accordance with either the maximum peak-particle-velocity limits of paragraph (d)(2), the scaled-distance equation of paragraph (d)(3), the blasting-level chart of paragraph (d)(4) of this section, or by the regulatory authority under paragraph (d)(5) of this section. All structures in the vicinity of the blasting area, not listed in paragraph (d)(2)(i) of this section, such as water towers, pipelines and other utilities, tunnels, dams, impoundments, and underground mines shall be protected from damage by establishment of a maximum allowable limit on the ground vibration, submitted by the operator and approved by the regu-

latory authority before the initiation of blasting.

(2) *Maximum peak-particle velocity.* (i) The maximum ground vibration shall not exceed the following limits at the location of any dwelling, public building, school, church, or community or institutional building outside the permit area:

Distance (<i>D</i>), from the blasting site, in feet	Maximum allowable peak particle velocity (<i>V</i> max) for ground vibration, in inches/second ¹	Scaled-distance factor to be applied without seismic monitoring ² (<i>Ds</i>)
0 to 300	1.25	50
301 to 5,000	1.00	55
5,001 and beyond	0.75	65

¹ Ground vibration shall be measured as the particle velocity. Particle velocity shall be recorded in three mutually perpendicular directions. The maximum allowable peak particle velocity shall apply to each of the three measurements.

² Applicable to the scaled-distance equation of Paragraph (d)(3)(i) of this section.

(ii) A seismographic record shall be provided for each blast.

(3) *Scaled-distance equation.* (i) An operator may use the scaled-distance equation, $W=(D/Ds)^2$, to determine the allowable charge weight of explosives to be detonated in any 8-millisecond period, without seismic monitoring; where *W*=the maximum weight of explosives, in pounds; *D*=the distance, in feet, from the blasting site to the nearest protected structure; and *Ds*=the scaled-distance factor, which may initially be approved by the regulatory authority using the values for scaled-distance factor listed in paragraph (d)(2)(i) of this section.

(ii) The development of a modified scaled-distance factor may be authorized by the regulatory authority on receipt of a written request by the operator, supported by seismographic records of blasting at the minesite. The modified scaled-distance factor shall be determined such that the particle velocity of the predicted ground vibration will not exceed the prescribed maximum allowable peak particle velocity of paragraph (d)(2)(i) of this section, at a 95-percent confidence level.

(4) *Blasting-level chart.* (i) An operator may use the ground-vibration limits in Figure 1 to determine the maximum allowable ground vibration.

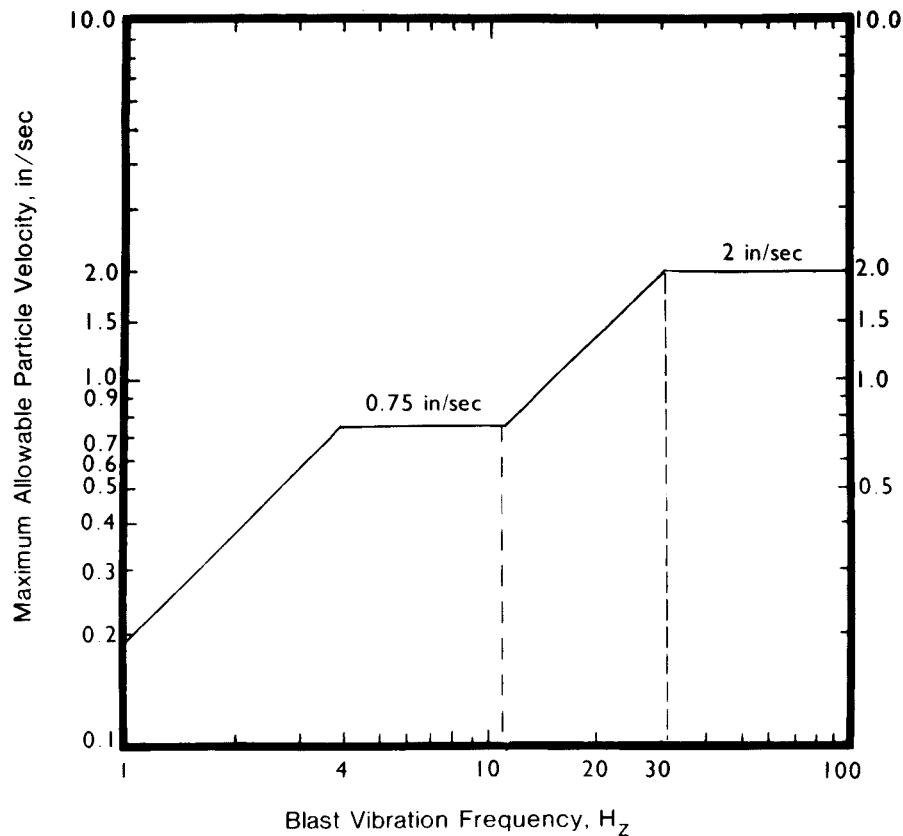


Figure 1. Alternative blasting level criteria.

(Source: Modified from figure B-1, Bureau of Mines RI8507)

(ii) If the Figure 1 limits are used, a seismographic record including both particle velocity and vibration-frequency levels shall be provided for each blast. The method for the analysis of the predominant frequency contained in the blasting records shall be approved by the regulatory authority before application of this alternative blasting criterion.

(5) The maximum allowable ground vibration shall be reduced by the regulatory authority beyond the limits otherwise provided by this section, if determined necessary to provide damage protection.

(6) The regulatory authority may require an operator to conduct seismic

monitoring of any or all blasts and may specify the location at which the measurements are taken and the degree of detail necessary in the measurement.

(e) The maximum airblast and ground-vibration standards of paragraphs (b) and (d) of this section shall not apply at the following locations:

(1) At structures owned by the permittee and not leased to another person,

(2) At structures owned by the permittee and leased to another person, if

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a written waiver by the lessee is submitted to the regulatory authority before blasting.

[48 FR 9810, Mar. 8, 1983, as amended at 48 FR 44781, Sept. 30, 1983]

§817.68 Use of explosives: Records of blasting operations.

The operator shall retain a record of all blasts for at least 3 years. Upon request, copies of these records shall be made available to the regulatory authority and to the public for inspection. Such records shall contain the following data:

- (a) Name of the operator conducting the blast.
- (b) Location, date, and time of the blast.
- (c) Name, signature, and certification number of the blaster conducting the blast.
- (d) Identification, direction, and distance, in feet, from the nearest blast hole to the nearest dwelling, public building, school, church, community or institutional building outside the permit area, except those described in §817.67 (e).
- (e) Weather conditions, including those which may cause possible adverse blasting effects.
- (f) Type of material blasted.
- (g) Sketches of the blast pattern including number of holes, burden, spacing, decks, and delay pattern.
- (h) Diameter and depth of holes.
- (i) Types of explosives used.
- (j) Total weight of explosives used per hole.
- (k) The maximum weight of explosives detonated in an 8-millisecond period.
- (l) Initiation system.
- (m) Type and length of stemming.
- (n) Mats or other protections used.
- (o) Seismographic and airblast records, if required, which shall include—
 - (1) Type of instrument, sensitivity, and calibration signal or certification of annual calibration;
 - (2) Exact location of instrument and the date, time, and distance from the blast;
 - (3) Name of the person and firm taking the reading;
 - (4) Name of the person and firm analyzing the seismographic record; and

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(5) The vibration and/or airblast level recorded.

(p) Reasons and conditions for each unscheduled blast.

[48 FR 9811, Mar. 8, 1983]

§817.71 Disposal of excess spoil: General requirements.

(a) *General.* Excess spoil shall be placed in designated disposal areas within the permit area, in a controlled manner to—

(1) Minimize the adverse effects of leachate and surface water runoff from the fill on surface and ground waters;

(2) Ensure mass stability and prevent mass movement during and after construction; and

(3) Ensure that the final fill is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use.

(b) *Design certification.* (1) The fill and appurtenant structures shall be designed using current, prudent engineering practices and shall meet any design criteria established by the regulatory authority. A qualified registered professional engineer experienced in the design of earth and rock fills shall certify the design of the fill and appurtenant structures.

(2) The fill shall be designed to attain a minimum long-term static safety factor of 1.5. The foundation and abutments of the fill must be stable under all conditions of construction.

(c) *Location.* The disposal area shall be located on the most moderately sloping and naturally stable areas available, as approved by the regulatory authority, and shall be placed, where possible, upon or above a natural terrace, bench, or berm, if such placement provides additional stability and prevents mass movement.

(d) *Foundation.* (1) Sufficient foundation investigations, as well as any necessary laboratory testing of foundation material, shall be performed in order to determine the design requirements for foundation stability. The analyses of foundation conditions shall take into consideration the effect of underground mine workings, if any, upon the stability of the fill and appurtenant structures.